UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,556	05/16/2001	Timothy Warner	01101	1507

23338 7590 03/02/2005

DENNISON, SCHULTZ, DOUGHERTY & MACDONALD
1727 KING STREET
SUITE 105
ALEXANDRIA, VA 22314

EXAMINER	
MORILLO, JANELL COMBS	
ART UNIT	**PAPER NUMBER**
1742	

DATE MAILED: 03/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/855,556	WARNER, TIMOTHY	
	Examiner	Art Unit	
	Janelle Combs-Morillo	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26-28* is/are allowed.

6)☒ Claim(s) *16-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 15, 2004 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 16-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasato et al (US 5,865,912 A) in view of "ASM Vol. 15 Casting" (hereinafter ASM Vol. 15).

Miyasato teaches rolled, forged, or extruded (column 18 line 60, column 3 lines 7-12) aluminum alloy product typically 0.35-2.1 inches thick (9-53 mm, column 6 lines 23-26), with a composition consisting of (in weight%): 5.2-6.8% Zn, 1.7-2.4% Cu, 1.6-2% Mg, 0.03-0.3%Zr, balance aluminum (abstract). Miyasato teaches a conventional T6 temper can be applied- which includes solution heat treating, quenching, and artificially aging (column 20 lines 47-50), substantially as presently claimed. Miyasato teaches that said product is preferably 85-100% unrecrystallized (column 16 lines 43-46), and therefore Miyasato is held to meet the presently

claimed limitations of "partly recrystallized" as well as <35 vol% recrystallized grains in between one-quarter and mid-thickness. Miyasato does not a) specify the intercept distance between recrystallized areas, or b) teach the as-cast grain size.

Concerning item a), as stated above, Miyasato teaches a partly recrystallized AlZnMgCu alloy product that is processed in substantially the same way as the presently claimed product. The examiner points out that where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims (such as distance between recrystallized areas) are necessarily present. See MPEP 2112.01.

Concerning item b), ASM Vol. 15 teaches "grain refining is widely practiced in the commercial production of virtually all aluminum alloys, whether wrought or cast" (page 476, column 1), and Ti and/or B act as grain refiners during solidification (see ASM Vol. 15 p 476 columns 1-2). For instance, a grain refined AA 7050 can exhibit a grain size from 150-340 μm (see Fig. 68 page 481). ASM Vol. 15 teaches 0.01-0.08% Ti and about 0.003% B are typically used to refine grains (page 477, column 3), and that the addition of Ti and B is a result effective variable (the expected result being finer grains with increased addition, Figs. 65, 66). It would have been obvious to one of ordinary skill in the art to add Ti and B to the alloy taught by Miyasato in order to obtain a finer grain structure, within the presently claimed 270-800 μm (claim 16) or 300-800 μm (claim 25) as cast grain size, because ASM Vol. 15 teaches an

overlapping as-cast grain size (for AA 7050 that has added Ti and B), or because the addition or grain refiners Ti+B is a result effective variable.

Changes in temperature, concentrations, or other process conditions of an old process does not impart patentability unless the recited ranges are critical, i.e. they produce a new and unexpected result. However, said parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Because Miyasato and ASM Vol. 15 teaches a partly recrystallized aluminum alloy product with substantially the same composition and processed substantially as presently claimed, it is held that the combination of Miyasato and ASM Vol. 15 has created a prima facie case of obviousness of the presently claimed invention.

Concerning dependent claims 17-19, ASM Vol. 15 teaches 0.01-0.08% Ti and about 0.003% B are typically used to refine grains (page 477, column 3). Said grain-refining inoculants titanium or titanium plus boron are added typically as master alloys to molten metal before casting, and provide fine, uniform grain structure in the as-cast state (p 477).

Concerning dependent claims 20 and 21, as stated above, because the prior art teaches substantially the same product processed substantially as presently disclosed/ claimed, then the properties applicant discloses and/or claims (such as distance between recrystallized areas) is expected to be present. See MPEP 2112.01.

Concerning dependent claims 22 and 23, Miyasato teaches an overlapping alloy composition (as stated above).

Concerning dependent claim 24, Miyasato teaches that said product can be used for a structural member of an aircraft (column 19 lines 53-54).

4. Claims 16-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shahani et al (US 6,027,582) in view of "ASM Vol. 15 Casting" (hereinafter ASM Vol. 15).

Shahani teaches a rolled, extruded or forged AlZnMgCu alloy >60 mm thick with the following composition (in weight%): 5.7-8.7% Zn, 1.7-2.5% Mg, 1.2-2.2% Cu, <0.14% Fe, <0.11% Si, 0.05-0.15% Zr, <0.02% Mn, <0.02% Cr (column 3 lines 38-52), optionally Ti (column 1 line 60). Shahani teaches the application of a T6 temper (column 16 line 5), which includes solution heating, quenching, artificially aging. Shahani teaches that the fraction of the recrystallized grains between the quarter thickness and half thickness ≤ 35% (column 4 lines 1-4). Shahani does not a) specify the intercept distance between recrystallized areas, or b) teach the as-cast grain size.

Concerning item a), as stated above, Shahani teaches a partly recrystallized AlZnMgCu alloy product that is processed in substantially the same way as the presently claimed product. The examiner asserts that where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims (such as distance between recrystallized areas) are necessarily present. See MPEP 2112.01.

Concerning item b), ASM Vol. 15 teaches "grain refining is widely practiced in the commercial production of virtually all aluminum alloys, whether wrought or cast" (page 476, column 1), and Ti and/or B act as grain refiners during solidification (see ASM Vol. 15 p 476 columns 1-2). For instance, a grain refined AA 7050 can exhibit a grain size from 150-340 μm (see Fig. 68 page 481). ASM Vol. 15 teaches 0.01-0.08% Ti and about 0.003% B are typically used to refine grains (page 477, column 3), and that the addition of Ti and B is a result effective variable (the expected result being finer grains with increased addition, Figs. 65, 66). It would have been obvious to one of ordinary skill in the art to add Ti and B to the alloy taught by Shahani in order to obtain a finer grain structure, within the presently claimed 300-800 μm as cast grain size, because ASM Vol. 15 teaches an overlapping as-cast grain size (for AA 7050 that has added Ti and B), or because the addition or grain refiners Ti+B is a result effective variable (as set forth above).

Concerning dependent claims 20 and 21, as stated above, because the prior art teaches substantially the same product processed substantially as presently disclosed/ claimed, then the properties applicant discloses and/or claims (such as distance between recrystallized areas) is expected to be present. See MPEP 2112.01.

Concerning dependent claims 22 and 23 Shahani teaches an overlapping alloy composition (as stated above).

Concerning dependent claim 24, Shahani teaches that said product can be used for a structural member of an aircraft (abstract).

Allowable Subject Matter

5. Claims 26-28 are allowable over the prior art of record.

6. The following is a statement of reasons for the indication of allowable subject matter: the examiner agrees that said claims are commensurate in scope with the unexpected results in the instant specification. Applicant has shown unexpected improved fracture toughness for a partially recrystallized AA7050 aluminum alloy product with the presently claimed critical as cast grain size range and characteristic intercept distance (see esp. Tables 2, 5, and Figs. 2 and 3 of the instant specification).

Response to Amendment/Arguments

7. In the response filed December 15, 2004, applicant added new claims 26-28. The examiner agrees that no new matter has been added.

Applicant's argument that the prior art does not teach an overlapping as cast grain size has not been found persuasive. As stated in the above rejection, "ASM Vol. 15" teaches that grain refined AA7050 can exhibit a grain size from 150-340 μm (see Fig. 68 p 481). Applicant's argument that the present invention is allowable over the prior art of record because that the ASM document taken as a whole does not teach exceeding a grain size of greater than about 260 microns has not been found persuasive. Though the second case on page 477 is applicable to reduce grain size and would result in a grain size below 300 μm, this does not preclude the first case of having a Ti/B ratio of between 0.8-3, which is also represented in Fig. 68. Therefore, given the disclosure of "ASM Vol. 15", it is within the level of one of ordinary skill in the art to obtain a 7050 alloy that has been grain refined, with an as cast grain size of 150-340 μm, which overlaps the presently claimed as cast grain size of 270-800 μm.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCM
February 24, 2005